IMPORTANT INFORMATION

READ FIRST

• READ this user's manual before using this user system interface cable.

• KEEP the user's manual handy for future reference.

Do not attempt to use the user system interface cable until you fully understand its mechanism.

User System Interface Cable:

Throughout this document, the term "user system interface cable" shall be defined as the following product produced only by Renesas Technology Corp. excluding all subsidiary products.

- User system interface cable (HS2556ECH61H)

The user system or a host computer is not included in this definition.

Purpose of the User System Interface Cable:

This user system interface cable is for connecting the emulator station and user system. This user system interface cable must only be used for the above purpose.

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It is highly recommended that first-time users be instructed by users that are well versed in the operation of the user system interface cable.

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SAFETY PAGE

READ FIRST

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DEFINITION OF SIGNAL WORDS

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION **CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE emphasizes essential information.

⚠ WARNING

Observe the precautions listed below. Failure to do so will result in a FIRE HAZARD and will damage the user system and the emulator product or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

1. **Do not repair or remodel the emulator product by yourself for electric shock prevention and quality assurance.**
2. **Always switch OFF the E6000 emulator and user system before connecting or disconnecting any CABLES or PARTS.**
3. **Always before connecting any CABLES, make sure that pin 1 on both sides are correctly aligned.**

H8S/2556,H8S/2552,H8S/2506 Groups FP-144J
User System Interface Cable (HS2556ECH61H) for E6000 Emulator User's Manual

H8S/2556 E6000 HS2556ECH61HE

H8S Family / H8S/2500 Series

User's Manual

Rev.1.00
2003.6.3

Renesas Technology
www.renesas.com

Cautions

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Preface

Thank you for purchasing this user system interface cable (HS2556ECH61H) for the Renesas's original microcomputer H8S/2556, H8S/2552, and H8S/2506 groups.

The HS2556ECH61H is a user system interface cable that connects an H8S/2556, H8S/2552, and H8S/2506 groups E6000 emulator (HS2556EPI61H; hereinafter referred to as the emulator) to the IC socket for a FP-144J package for the H8S/2556, H8S/2552, and H8S/2506 groups MCU on the user system.

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Section 1 Configuration

CAUTION

Use an NQPACK144SD socket (manufactured by Tokyo Eletech Corporation) for the FP-144J package IC socket on the user system.

Figure 1 shows the configuration of the HS2556ECH61H user system interface cable for the FP-144J package.

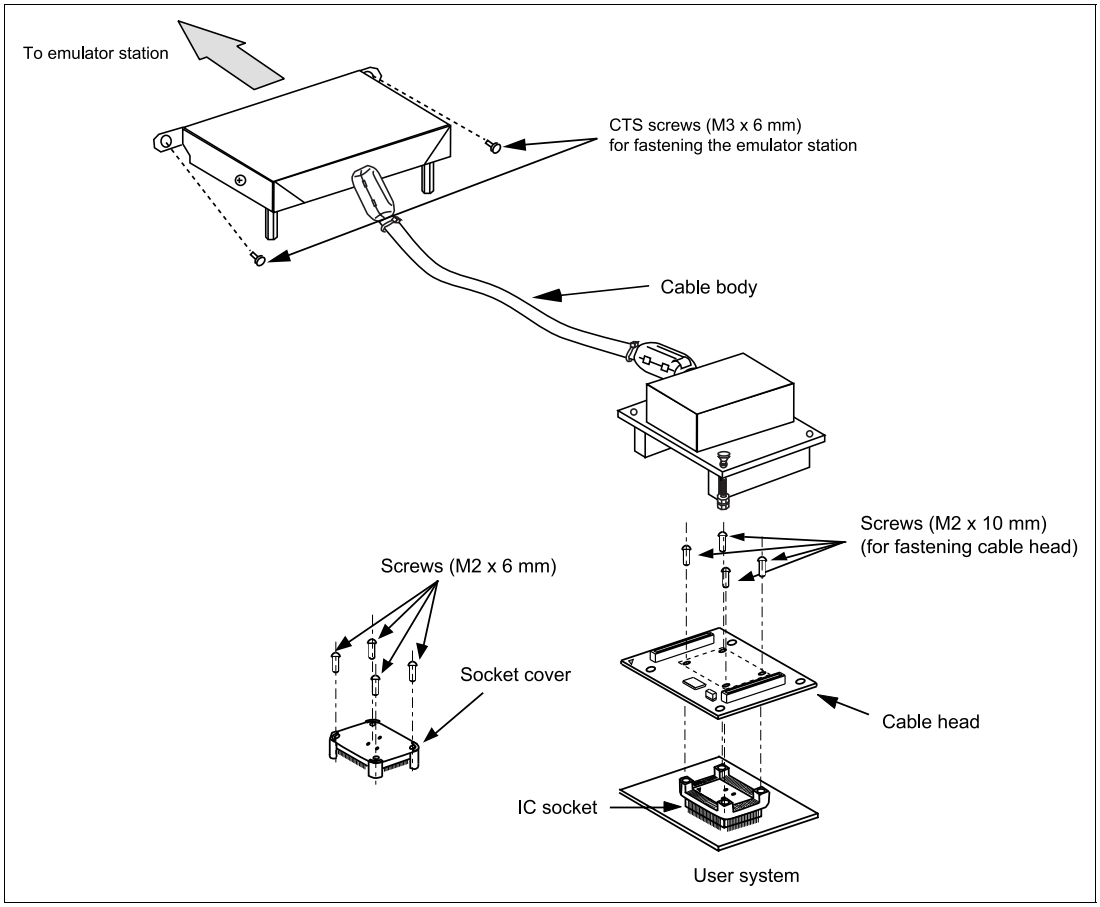

Figure 1 HS2556ECH61H User System Interface Cable

Table 1 lists the HS2556ECH61H components. Please make sure you have all of these components when unpacking.

Table 1 HS2556ECH61H Components

No.	Component	Quantity	Remarks
1	Cable body	1	Cable
2	Cable head	1	
3	IC socket	1	For the FP-144J package
4	Socket cover	1	For installing an FP-144J packaged MCU
5	Screws (M2 x 10 mm)	4	For fastening cable head
6	Screws (M2 x 6 mm)	4	For installing an FP-144J packaged MCU
7	Guide pins (ϕ 1 mm)	3	For determining the IC socket location
8	CTS screws (M3 x 6 mm)	2	For fastening emulator body
9	Screwdriver	1	For tightening screws
10	Documentation	1	User's manual for HS2556ECH61H (this manual)

Section 2 Connection Procedures

2.1 Connecting User System Interface Cable to Emulator Station

⚠ WARNING

Observe the precautions listed below. Failure to do so will result in a FIRE HAZARD and will damage the user system and the emulator product or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

1. **Always switch OFF the user system and the emulator product before the USER SYSTEM INTERFACE CABLE is connected to or removed from any part. Before connecting, make sure that pin 1 on both sides are correctly aligned.**
2. **The user system interface cable dedicated to the emulator must be used.**

To connect the cable body to the emulator station, follow the instructions below.

1. Make sure the user system and emulator station are turned off.

CAUTION

When connecting or removing the user system interface cable, apply force only in the direction suitable for connection or removal, while making sure not to bend or twist the cable or connectors. Otherwise, the connectors will be damaged.

2. After making sure the direction of the cable body connector is correct, firmly insert the cable body connector into the emulator station socket (figure 2).

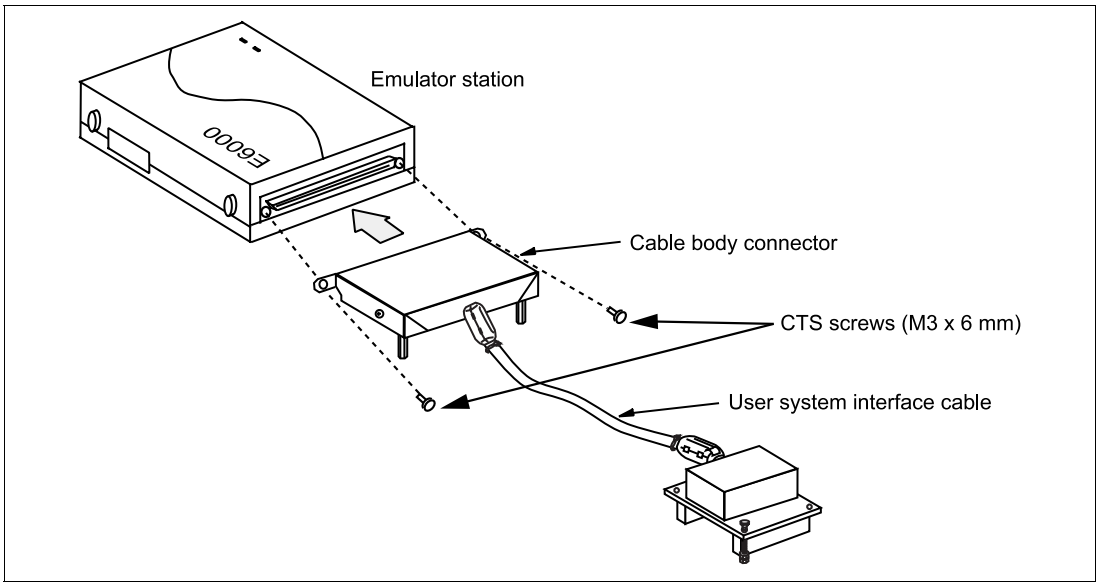

Figure 2 Connecting User System Interface Cable to Emulator Station

2.2 Connecting User System Interface Cable to User System

⚠ WARNING

Always switch OFF the user system and the emulator product before the USER SYSTEM INTERFACE CABLE is connected to or removed from any part. Before connecting, make sure that pin 1 on both sides are correctly aligned. Failure to do so will result in a FIRE HAZARD and will damage the user system and the emulator product or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

To connect the cable head to the user system, follow the instructions below.

2.2.1 Installing IC Socket

1. Confirming the location of IC socket

CAUTION

After confirming the location of pin 1 on the IC socket, apply epoxy resin adhesive to the end of the four projections at the bottom of the IC socket, and fasten it to the user system.

Use the guide pins provided to determine where to install the IC socket, as shown in figure 3.

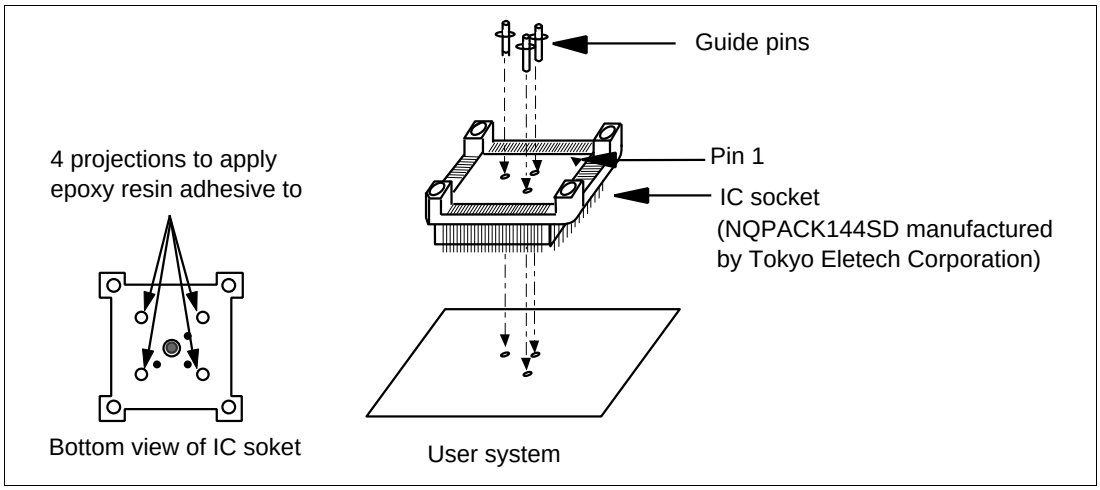

Figure 3 Location Setting of IC Socket

2. Solder the IC socket for a FP-144J package to the user system.

CAUTION

Be sure to completely solder the leads so that the solder slops gently over the leads and forms solder fillets. (Use slightly more solder than the MCU.)

2.2.2 Inserting Cable Head

CAUTION

Check the location of pin 1 before inserting.

Align pin 1 on the IC socket for a FP-144J system interface cable head into the IC socket on the user system, as shown in figure 4.

2.2.3 Fastening Cable Head

CAUTION

1. **Use a Philips-type screwdriver whose head matches the screw head.**
2. **The tightening torque must be 0.054 N•m or less. If the applied torque cannot be accurately measured, stop tightening when the force required to turn the screw becomes significantly greater than that needed when first tightening. If a screw is tightened too much, the screw head may break or an IC socket contact error may be caused by a crack in the IC socket solder.**
3. **If the emulator does not operate correctly, cracks might have occurred in the solder. Check conduction with a tester and re-solder the IC socket if necessary.**

Fasten the user system interface cable head to the IC socket for an FP-144J package on the user system with the four screws (M2 x 10 mm) provided. Each screw should be tightened a little at a time, alternating between screws on opposing corners. Take special care, such as manually securing the IC socket soldered area, to prevent the soldered IC socket from being damaged by overtightening the screws or twisting the components.

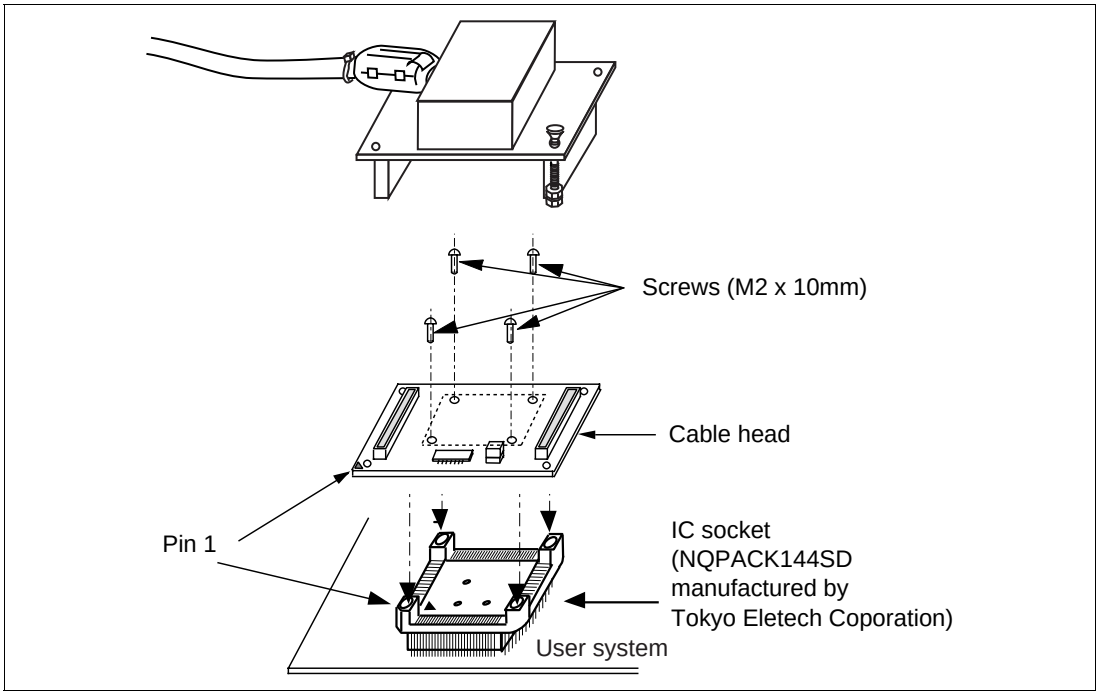

Figure 4 Connecting User System Interface Cable to User System

2.2.4 Fastening Cable Body

Connect the cable body to the cable head.

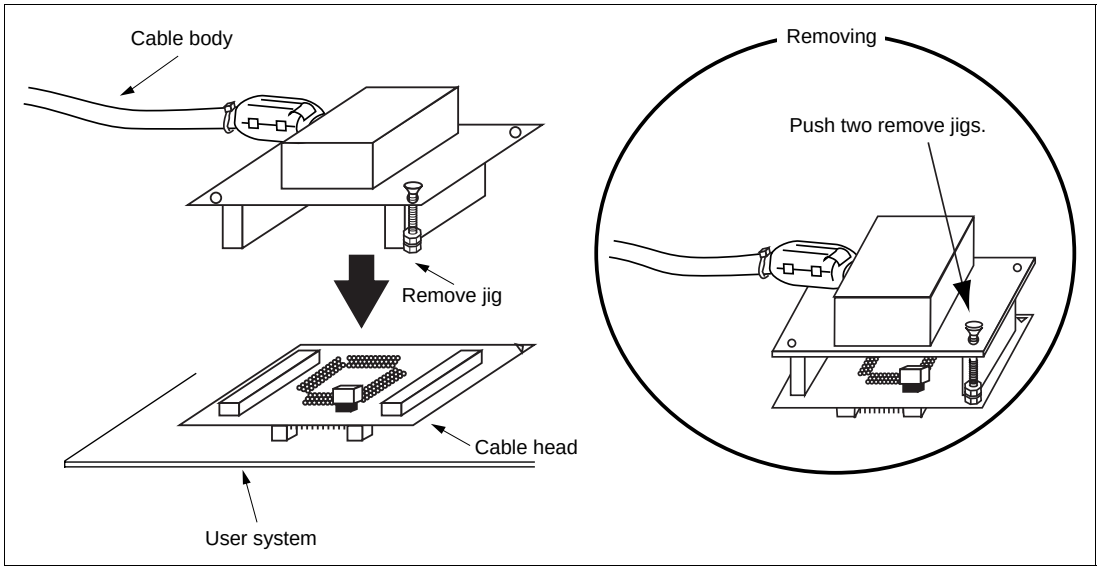

Figure 5 Fastening Cable Body

2.3 Recommended Dimensions for User System Mount Pad

Figure 6 shows the recommended dimensions for the mount pad (footprint) for the user system with an IC socket for an FP-144J package (NQPACK144SD: manufactured by Tokyo Eletech Corporation). Note that the dimensions in figure 6 are somewhat different from those of the actual chip's mount pad.

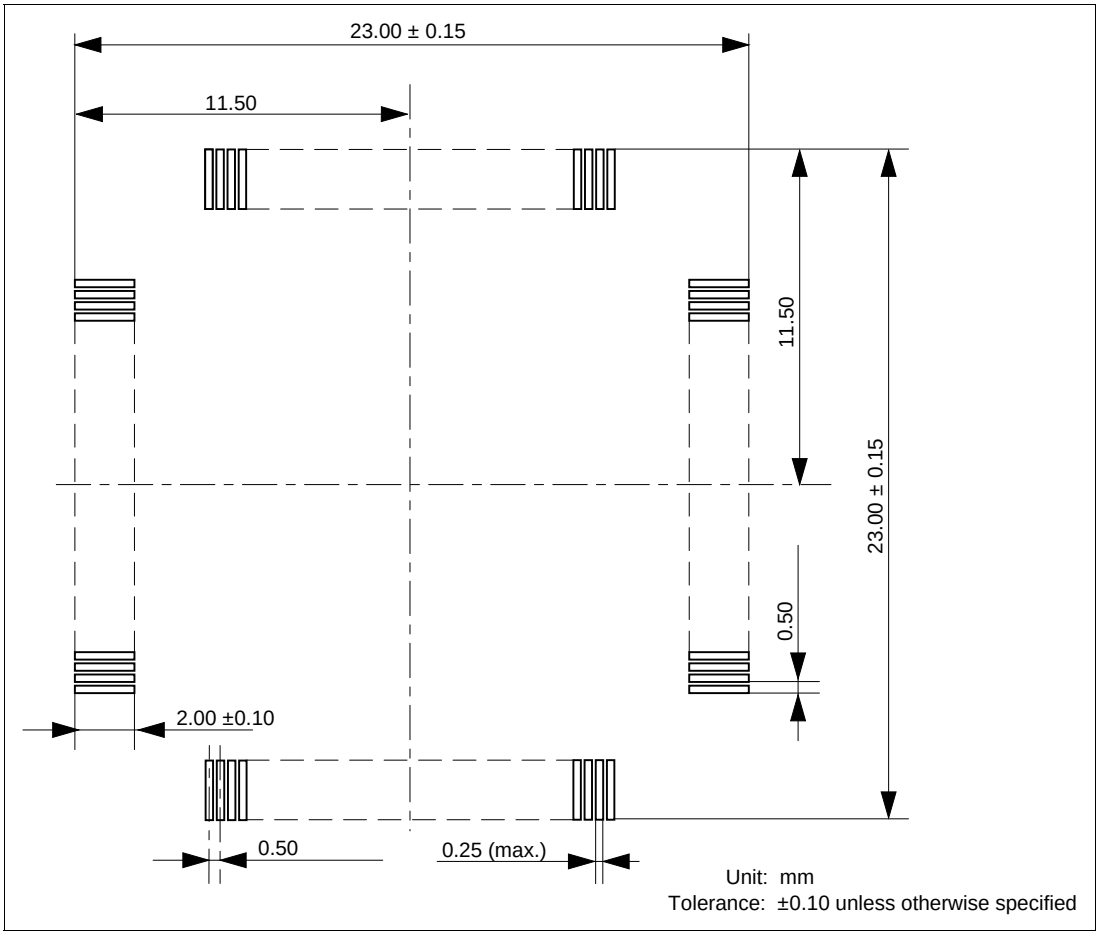

Figure 6 Recommended Dimensions for Mount Pad

2.4 Dimensions for User System Interface Cable Head

The dimensions for the user system interface cable head are shown in figure 7.

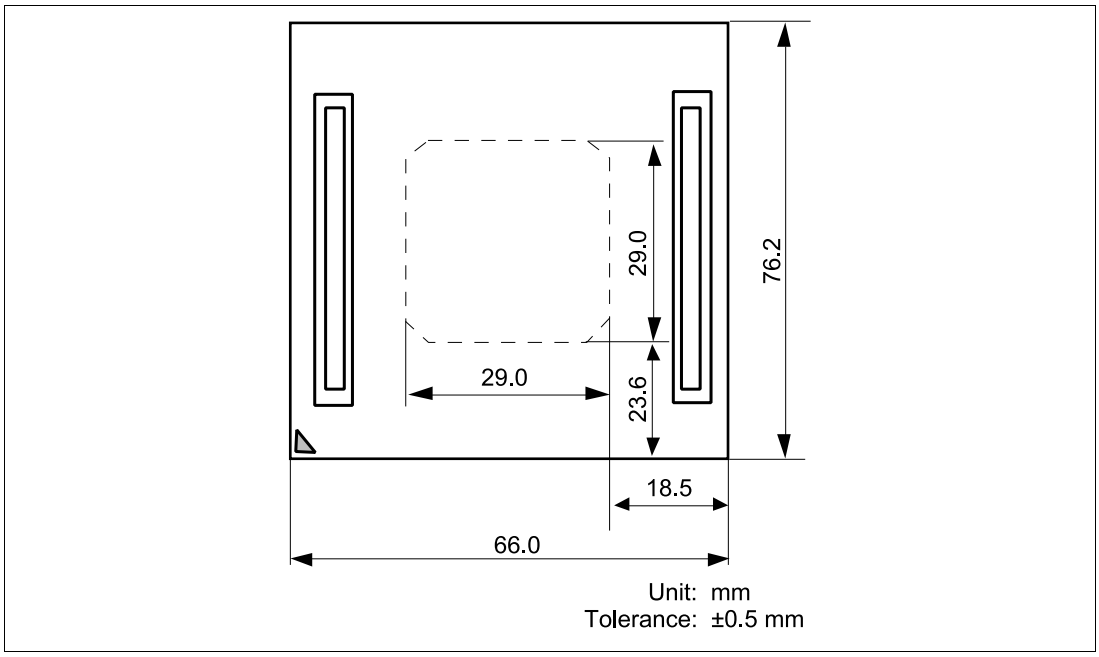

Figure 7 Dimensions for User System Interface Cable Head

2.5 Resulting Dimensions after Connecting User System Interface Cable

The resulting dimensions, after connecting the user system interface cable head to the user system, are shown in figure 8.

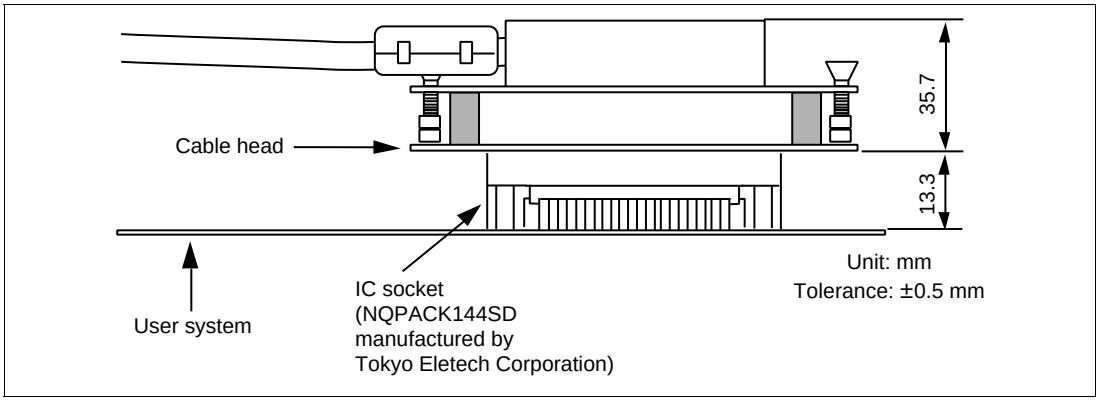

Figure 8 Resulting Dimensions after Connecting User System Interface Cable

Section 3 Installing the MCU to the User System

CAUTION

1. **Check the location of pin 1 before inserting.**
2. **Use a Philips-type screwdriver whose head matches the screw head.**
3. **The tightening torque must be 0.054 N•m or less. If the applied torque cannot be accurately measured, stop tightening when the force required to turn the screw becomes significantly greater than that needed when first tightening. If a screw is tightened too much, the screw head may break or an IC socket contact error may be caused by a crack in the IC socket solder.**
4. **If the MCU does not operate correctly, cracks might have occurred in the solder. Check conduction with a tester and re-solder the IC socket if necessary.**

Check the location of pin 1 before inserting the MCU into the IC socket on the user system, as shown in figure 9. After inserting the MCU, fasten the socket cover with the provided four screws (M2 x 6 mm). Take special care, such as manually securing the IC socket soldered area, to prevent the IC socket from being damaged by overtightening the screws or twisting the components.

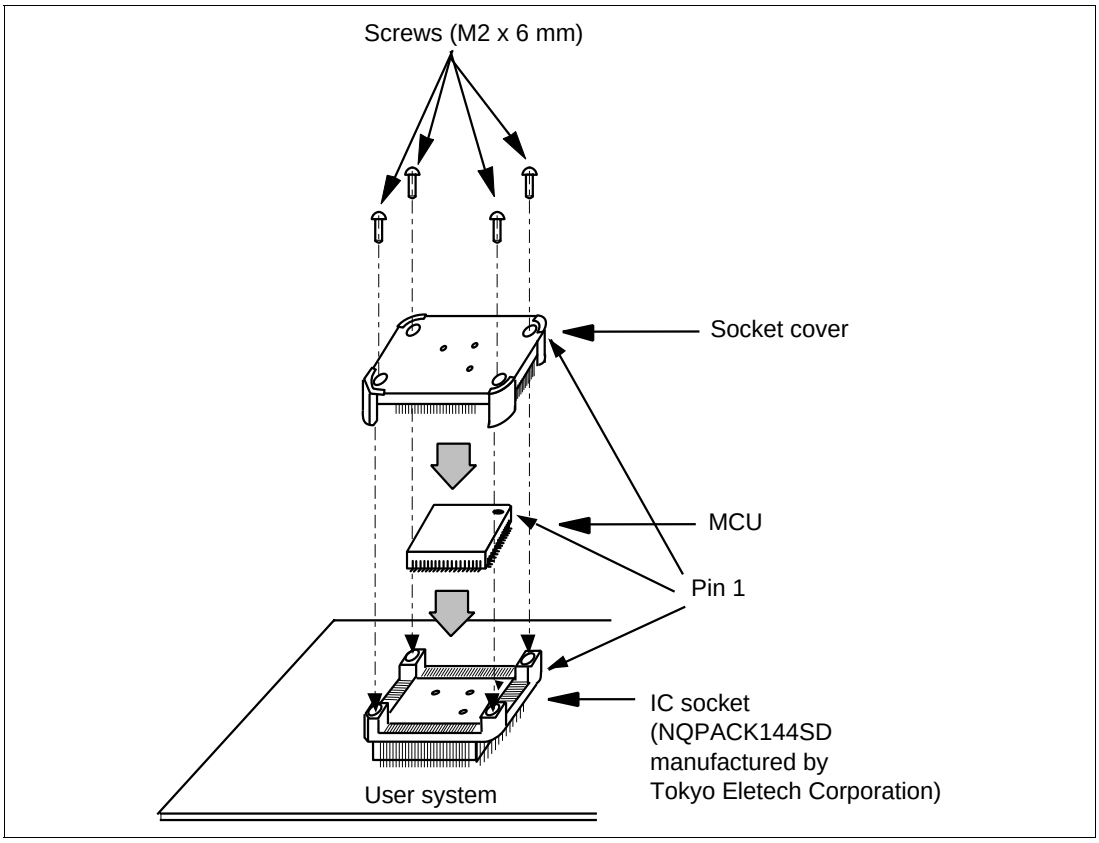

Figure 9 Installing MCU to User System

Section 4 Verifying Operation

1. When using the H8S/2556, H8S/2552, and H8S/2506 groups E6000 emulator, turn on the emulator according to the procedures described in the H8S/2556, H8S/2552, and H8S/2506 groups E6000 Emulator User's Manual (HS2556EPI61HE).
2. Verify the user system interface cable connections by accessing the external memory and ports to check the bus states of the pins. If an error is detected, recheck the soldered IC socket and the location of pin 1.
3. The emulator connected to this user system interface cable supports two kinds of clock sources as the MCU clock: an emulator internal clock and an external clock on the user system. For details, refer to the H8S/2556, H8S/2552, and H8S/2506 groups E6000 Emulator User's Manual (HS2556EPI61HE).
   - To use the emulator internal clock
     Select the clock in the emulator station with the [CLOCK] option in the [Configuration Properties] dialog box.
   - To use the external clock on the user system
     Select external clock (target or target/2) with the [CLOCK] option in the [Configuration Properties] dialog box, and supply the external clock from the user system to the emulator. Supply the external clock to the system clock by inputting the external clock from the EXTAL terminal on the cable head or connecting a crystal oscillator to the EXTAL and XTAL terminals. To supply the external clock to the subclock, connect the 32.768-kHz crystal oscillator to the OSC1 and OSC2 terminals. For details, refer to section 21, Clock Pulse Generator, in the H8S/2556, H8S/2552, and H8S/2506 groups Hardware Manual. The user system interface cable has the oscillator circuits shown in figure 10. This circuit is located on the lower board of the H8S/2556, H8S/2552, and H8S/2506 groups.

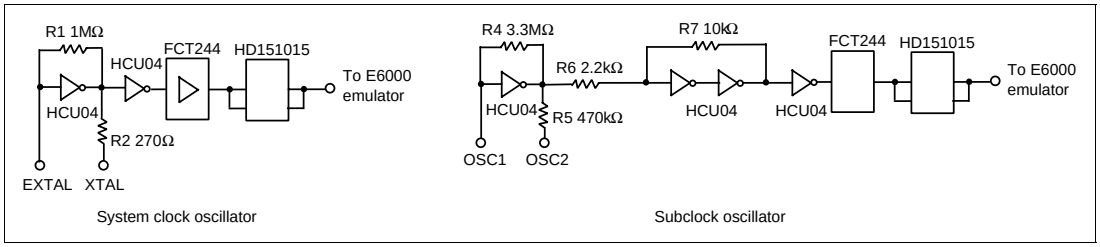

Figure 10 Clock Oscillator Circuits

Section 5 Notice

1. Make sure that pin 1 on the user system IC socket is correctly aligned with pin 1 on the cable head before inserting the cable head into the user system IC socket.
2. The dimensions of the recommended mount pad for the user system IC socket are different from those of the MCU.
3. This user system interface cable is specifically designed for the HS2556EPI61H emulator. Do not use this cable with any other emulator station.
4. To prevent breaking of wires in the cable body, do not place heavy or sharp metal objects on the user system interface cable.
5. While the emulator station is connected to the user system with the user system interface cable, force must not be applied to the cable head. Place the emulator station, user system interface cable, and user system as shown in the example in figure 11.

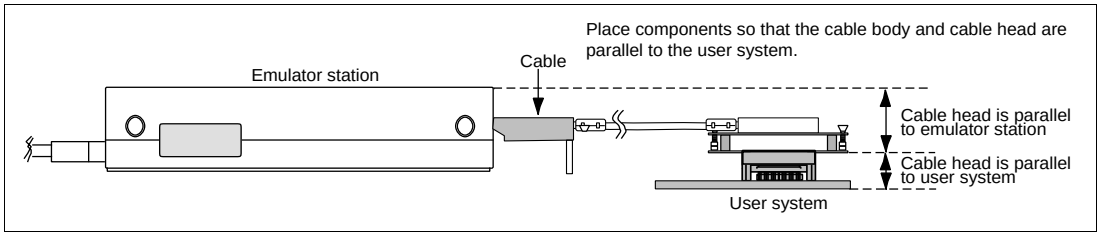
Place components so that the cable body and cable head are parallel to the user system.
Cable
Emulator station
Cable head is parallel to emulator station
Cable head is parallel to user system
User system

Figure 11 User System Interface Cable Location Example

6. The P1 jumper connector is used for testing. Do not remove the inserted jumper pin.

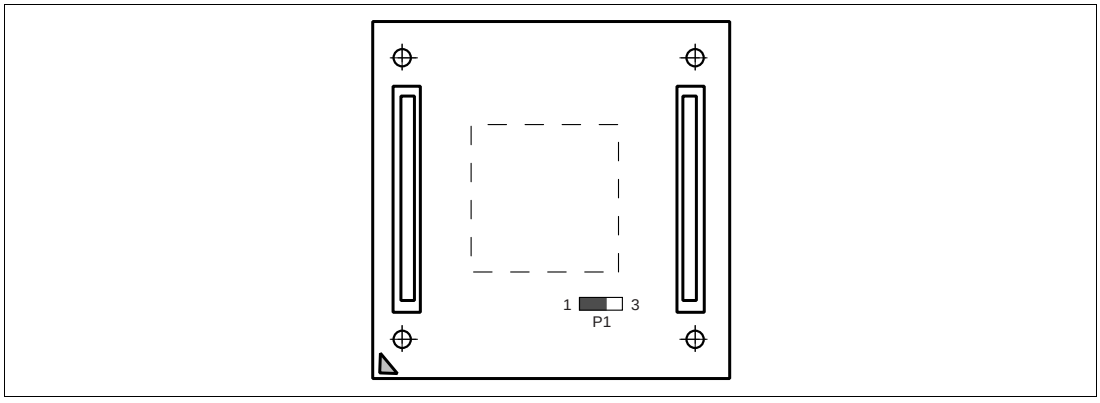

Figure 12 P1 Short Connector

H8S/2556,H8S/2552H8S/2506 Group FP-144J
User System Interface Cable (HS2556ECH61H)
for E6000 Emulator User's Manual

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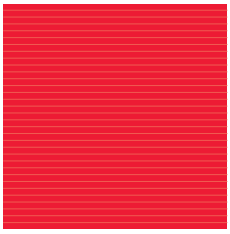

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